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Molecular genetics is a field of study that examines how life functions at a diminutive level where DNA, RNA and proteins are at play. Professor Karen Kirk, an associate professor in the Biology Department of Lake Forest College, introduced the Molecular Genetics course three years ago. Before then, Professor Kirk taught a course of Genetics.

The transition from Genetics to Molecular Genetics was Professor Kirk's interest to teach students better molecular science. Genetics was a core course offered to sophomore students, and then became a 300-level course. This field of study has advanced biology attached and made it difficult to teach at mere 200-level. Later, Professor Kirk changed the curriculum of Genetics course and renamed it Molecular Genetics. This way the program of study was then more focused on one aspect of the field of genetics. Molecular Genetics has been taught only for a semester, but it has gained an admirable respect from the faculty members in the biology department.

In the Molecular Genetics course, undergraduates had the rare opportunity of working on a laboratory project that spanned over the whole semester of the course. Students looked for the gene sequences of specific human traits in their own DNA. Some students had personal stories attached with what traits they picked. One student studied the gene that causes renal cancer because his father had died of that illness. Another student ventured to find the gene responsible for why he sweated too much when nervous. A couple of students studied the gene responsible for breast cancer. The research on genes in Professor Kirk's lab was highly unique because undergraduates explored their own genome, something few do in a course such as this.

The National Center for Biotechnology Information (NCBI) is a human genome database website that students used to search for the gene sequences on their traits of interest. Scientists have estimated that human have 30,000 to 34,000 total genes and of those more than two-thirds have been determined in their functions. Once the students picked their genes and searched out their sequences, they began their research to isolate them in their own cheek cells.

Students performed laboratory procedures independently. Occasionally, students were provided with small clues by Professor Kirk as to guide them. But all alone, students read detailed protocols to carry out their experiments.

The next step, which took the second half of the semester, was cloning and purifying the genes. Students then sent their genes for sequence to the University of Chicago DNA sequence facility. When the gene sequences arrived back, they were matched with gene sequences researched in online database.

The remarkable achievement from the experiment was that, in the end, half of the students had really isolated the genes of their traits. In view of that, Professor Kirk's truly wondrous imagination made the experiment a well-recognized success. Students had the rare opportunity to appreciate the power of DNA which holds the genetic material for describing human beings. The course was fun and exciting for students where they learned to work as real scientists with real tools of biotechnology.

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* This review of Molecular Genetics class is based on the interview with the course instructor, Professor Karen Kirk.